"Seeing the Other Side of the Hill":

The Art of Battle Command, Decisionmaking, Uncertainty, and the Information Superiority Complex

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I am convinced we are in a transition in battle command now with info technology as significant as back in the 1920s when we went from flag sets to wireless radios to combined arms to upbeat tempo.—General Frederick M. Franks, Jr.[1]

Much of battle command is inherently intellectual because people must transform data into information, then knowledge—and they must do it quickly. Mental acuity and the intellectual component of battle command will become critical as our future Army increasingly depends on the benefits of knowledge.—Brigadier General Huba Wass de Czege[2]

THE CURRENT GROWTH in military information technology and network-centric warfare (NCW) theory leads many military professionals and theorists to suggest that new technology will revolutionize the way commanders execute battle command by reducing uncertainty and friction, enhancing visualization and decisionmaking, and increasing the ability to gather and analyze information. Also, many believe network-centric operations will allow the commander and his forces to gain an information advantage or information superiority over an adversary by increasing situational understanding, enhancing information sharing, and increasing the speed of decisionmaking.

Military theorists, historians, and military professionals define battle command in terms of a commander's mental qualities and cognitive abilities. The mental process of battle command requires visualization and decisionmaking based on the commander's experience, knowledge, leadership, and ability to correctly request and analyze information. Although information technology will greatly enhance military operations, it will not alter the battle command process; therefore, mastering the art of battle command is still paramount to the commander's successful decisionmaking, creation of information superiority, and decisive military operations.

Commanders need information to make decisions, but the battle command process of changing information into knowledge to make a decision does not depend on information collection and dissemination. The ability to identify relevant information, create information superiority, and increase the speed of decisionmaking depends on the commander's intellect. Commanders focus information collection based on their cognitive process of understanding what they need to know to make a decision. Information collection is part of the art of battle command because commanders have to understand how to use limited collection assets to get the information they need and how to make decisions in conditions of uncertainty when they cannot collect all of the information they want.

The complexities of war will always create uncertainty and friction because war involves the human dimension, the enemy, and technology. Because of uncertainty and friction, even in network-centric warfare, the commander operates with erroneous, incomplete, overwhelming, or nonexistent information. Taking advantage of NCW capabilities puts a premium on a commander's ability to execute battle command. In the end, a commander's mastery of the art of battle command remains a key human dimension of network-centric warfare that will lead to decisive operations against a hostile, thinking enemy.

Defining Battle Command

Battle command is a relatively new term. In the past, military professionals, theorists, and historians defined it under various names: generalship, military genius, combat leadership, or the qualities of a Great Captain. Whatever the name, the qualities associated with battle command center on the mental qualities or cognitive abilities of commanders in combat. The Army's current definition of battle command—"the exercise of command in operations against a hostile, thinking enemy"—is further described as "principally an art" developed by "professional study, constant practice, and considered judgment."[3] Commanders who successfully execute the art of command in battle do so through visualization, decisionmaking, and leadership, where visualization and decisionmaking are based on judgment acquired from experience, training, study, and creative thinking.[4]

U.S. Army Field Manual (FM) 3-0, *Operations,* identifies visualization and decisionmaking as key qualities of battle command. To make a decision, the commander must combine judgment with information and know if to decide, what to decide, and when to decide. The commander's ability to know if, what, and when to decide is a by-product of his own visualization process before and during operations.

To visualize a military operation from beginning to end, a commander relies on mental skills to translate raw information into relevant information. Visualization requires the commander's judgment and experience to turn information into knowledge and understanding. A commander's visualization and decisionmaking also rely on his intuition. Rear Admiral Henry Eccles, a post-World War II military theorist, defines intuition as "the knowledge and discernment that help a person to sound judgments and decisions, either with or without a formal process of reason."[5] Intuition, experience, and judgment lead the commander to identify his decision points during his visualization process.

In *On War,* Carl von Clausewitz describes the qualities of military genius: courage, powers of intellect, coup d'oeil, and determination. The last three qualities relate to the use of information. According to Clausewitz, the powers of intellect include the commander's ability to deal with uncertainty through judgment and his ability to understand the truth. Coup d'oeil is "an intellect that, even in the darkest hour, retains some glimmerings of the inner light which leads to truth," and determination is "the courage to follow this faint light wherever it may lead." Together, coup d'oeil and determination make presence of mind, which is "nothing but an increased capacity of dealing with the unexpected."[6]

Twentieth-century military theorist J.F.C. Fuller defines the qualities of the master of the art of war as experience, reason, and genius, and the qualifications of a Great Captain as "imagination operating through reason, reason operating through audacity, and audacity operating through rapidity of movement."[7] The first two qualifications deal directly with the commander's mental processes of creativity and originality based on experience and reason.

In *Masters of the Art of Command*, military historians Martin Blumenson and James L. Stokesbury offer the image of a great commander as one who is "knowledgeable in his profession, experienced, bold, brave physically and morally, and [an] impressive man of decision and action."[8] They add that "the power to decide on an action, and the strength to see it through, are probably the most fundamental qualities of a great soldier."[9] They describe intuition and the ability to visualize operations through the eyes of the enemy as qualities that separate exceptional commanders from average ones.

In September 1993, General Frederick M. Franks, Jr., visited the U.S. Army's National Training Center (NTC) to talk to an observer/controller (O/C) team about training battle command and to ask for help to fix a serious "warfighting deficiency he had recognized for years—an absence of battle command skills and competencies in combined arms commanders."[10] To begin teaching battle command, the O/Cs first had to define the term. The group at the NTC had to convert "the concept into a set of fundamental skills and abilities a commander had to possess to master the art of battle command" and defined these "artistic skills" as "the ability to see the terrain and weather, the enemy, yourself, yourself from the enemy's perspective, and the battle."[11]

Military literature suggests that cognitive abilities are the essence of battle command and drive commanders to impose their will and their force's will on the enemy. Intellectual ability and artistic skills are the bedrock of battle command because war is not an exact science. As Fuller says: "If war were an exact science, reason in itself would be all but sufficient to arrive at correct judgments, but it is far from being exact, since it deals with differences between living creatures."[12] Cognitive

abilities commanders successfully demonstrate in dealing with uncertainty, decisionmaking, and action against a thinking adversary define battle command and are the same abilities commanders use to create information superiority.

When planning operations or facing uncertainty, visualization requires the commander to make successful decisions based on his training, experience, competence, intuition, and imagination. When leading forces in combat, especially during times of uncertainty and friction, the commander must exhibit presence of mind and will. The commander's continuous ability to execute the "visualize, describe, direct" process binds battle command qualities. Information technology is merely an advanced command and control (C2) capability that provides the commander the method by which he can direct battle command.

Network-Centric Warfare and Information Superiority

Information technology is one part of the theory of war termed network-centric warfare. The U.S. Department of Defense's Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Cooperative Research Program defines network-centric warfare as "an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization [that], in essence, translates information superiority into combat power by effectively linking knowledgeable entities in the battlespace."[13] One of the central tenets of network-centric warfare is the increased capability of the commander and his forces to create information superiority. Field Manual 3-0 defines information superiority as "the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same."[14] While disseminating information is vital to mission execution, the key to gaining information superiority is still a cognitive one—the commander and staff's ability to collect and process information.

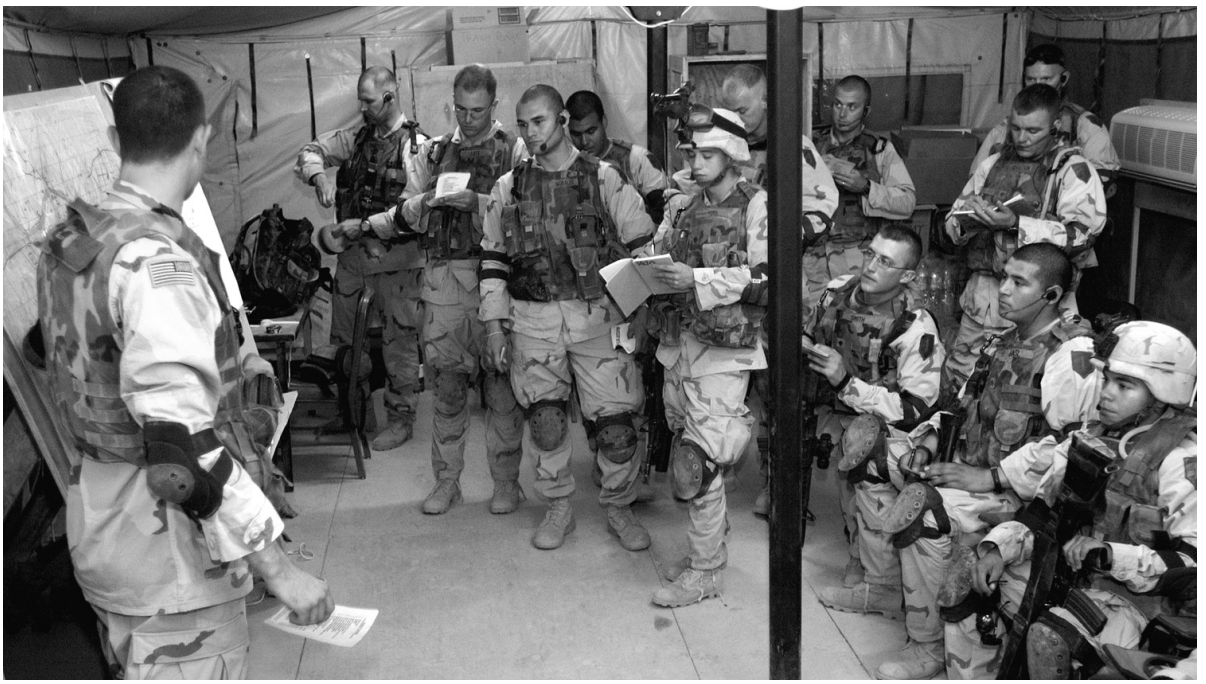
Commanders need relevant information to make better and faster decisions than the enemy because "the side possessing better information and using that information more effectively to gain understanding has a major advantage over its opponent."[15] Network-centric operations provide a unique opportunity for commanders to receive and share high volumes of information, but the process of changing raw data into relevant information to achieve superior knowledge, information superiority, and decision superiority is a human one. The qualities of battle command provide the commander with skills to increase the speed of his decisionmaking by leading his staff and managing information to eventually create decision superiority independent of the amount of information available.

Information Superiority and the Cognitive Process

To receive information relevant to the visualization and decisionmaking process, commanders must "manage their information resources, combine judgment with the knowledge of their staffs and subordinates, and use information systems to know the battlespace better than their adversaries."[16] To create information superiority, the commander needs to know what critical information he will need to make a decision, allocate the assets to collect it, and manage his staff to ensure he receives it. To gain information superiority, a commander uses intelligence, surveillance, and reconnaissance (ISR) and information management.

The commander integrates ISR based on his visualization, which, in turn, drives "the intelligence system."[17] Initially, a commander integrates ISR through the intelligence preparation of the battlefield (IPB), a cognitive process requiring the commander and his staff to develop an initial picture of the enemy and terrain that is continually updated when new information is received. IPB drives how the commander focuses information assets and integrates surveillance and reconnaissance operations to capitalize on capabilities across the battlespace.[18]

Successful ISR integration allows the commander to gather information and data about the enemy and terrain, but the ability to make better decisions than the enemy relies on information management, which is the "provision of relevant information to the right person at the right time in a usable form to facilitate situational understanding and decisionmaking."[19] The keys to information management are the commander's ability to decide what information is relevant to his decisionmaking and his ability to add meaning to relevant information through analysis and evaluation.



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Members of a quick response force are briefed on an upcoming mission in Iraq, 19 June 2005.

To aid decisionmaking, the commander identifies the information he requires, allowing information management to narrow the gap between available information and his requirements.[20] Information technology can overload the commander's staff and subordinates with information, but commanders "make the best use of information systems when they determine their information requirements and focus their staffs and organizations on meeting them."[21] When the commander conducts visualization and decisionmaking, he identifies the key information he will need to plan the operation and make future decisions based on experience, training, and expertise.

The commander identifies to his organization the key information he needs in the commander's critical information requirements (CCIR), which FM 3-0 defines as "the elements of information required by commanders that directly affect decisionmaking and dictate the successful execution of military operations."[22] Information the commander receives either confirms his vision or indicates that he needs to make a decision. Through experience and training, commanders ensure their CCIRs are focused so the staff can provide relevant information. But relevant information is not always complete or perfect information. Advanced technology provides information. The commander makes it relevant when he applies judgment and knowledge, which allows him to make informed decisions using less-than-perfect data that result from uncertainty, friction, the element of will, and the presence of a thinking enemy. Minimizing the effects of uncertainty and friction and making decisions faster than the enemy depend on the commander's cognitive ability to focus his staff on collecting the right information and, most important, on his mental ability to process it.

Uncertainty and Friction

The advances of technology have, to a certain extent, reduced friction and uncertainty in certain areas of warfare. The Global Positioning System allows individual soldiers and forces to maneuver and know locations more accurately regardless of weather and terrain. Networked systems allow commanders to pass information faster vertically and horizontally and to share the same battlefield visualization or common operational picture. New systems, such as Blue Force Tracker and the Command and Control Personnel Computer, allow forces to see real-time or near-real-time locations of friendly units from their individual vehicles. However, as new technology reduces friction and uncertainty in some ways, friction and uncertainty reemerge in others. Colonel H.R. McMaster states that "while it is vitally important to take all possible measures to reduce uncertainty and friction, it is equally important to recognize those factors that preserve uncertainty as a basic

feature of war"; thus, "as technology advances, new sources of uncertainty emerge."[23]

Several vulnerabilities and one universal constant continue to create uncertainty and friction in network-centric warfare. New technology brings with it new levels of friction, and uncertainty and friction are constants because war is a contest of wills between human beings. The nature of war remains unchanged and "cannot be eliminated" because its sources are the "effects of danger and exertion, existence of uncertainty and chance, unpredictable actions of other actors, frailties of machines and information, and humans."[24] The vulnerabilities of NCW technologies and the existence of a thinking adversary will, at the least, keep uncertainty and friction at a level commensurate with the history of warfare.

Information technology's first vulnerability is that information systems can overwhelm commanders and staffs because of the "sheer volume of information available and the fact that much of it is conflicting or irrelevant 'noise.'"[25] The ability of information systems to produce sheer volumes of information, accurate and inaccurate, relevant and irrelevant, is an inherent friction that puts a premium on a commander's ability to use his powers of intellect, including his ability to use judgment, intuition, and experience to understand and identify the relevant information he needs to make a decision.

The ability of network-centric operations to produce high volumes of information can cause commanders to become overly reliant on information technology. High volumes of information will always contain noise that will cause the friction and uncertainty that delay decisionmaking. But the noise might also hide relevant information that might or might not be readily apparent to the commander or his staff. In other instances, the one piece of information a commander is looking for might never come.

Relying too much on information technology can cause a commander to wait for all possible information in the hope he can make a risk-free decision. Commanders must couple information technology with confidence in their battle command skills to optimize decisionmaking under conditions of uncertainty. Drawing on battle command abilities allows them to make quick, timely decisions using the amount of information they receive.

Information technology and networks use sophisticated equipment and systems that can break or that adversaries can attack. Equipment failure can be a localized source of friction or affect the entire battlespace and all units within it. The commander's battle command qualities give him confidence to make decisions under uncertainty while using information technology only as an aid to decisionmaking. While new technology might reduce or add uncertainty and friction in war, there still is the one universal constant in the uncertainty equation—the enemy.

The presence of a thinking enemy and the psychological dimension of war contribute to an uncertainty that information technology cannot penetrate. War is a violent conflict between adversaries trying to impose their will on each other where "the will is directed at an animate object that reacts."[26] War contains killing and death; it is where a "struggle or interaction takes place in the psychological and emotional realms and affects fighting power on both sides [and where] uncertainty both derives from and reinforces the strains of war in ways that defy prediction."[27] The psychological and human sides of war will always perpetuate uncertainty because they are hard to quantify and predict. Many of the qualities of battle command have evolved from a commander's ability to deal with the uncertainties of war that its human and psychological dimensions create.

The human and psychological dynamics of warfare also preserve uncertainty because a commander can only make an informed, educated guess about the enemy's plans and intent. The commander only assumes, through experience, study, and intuition, how the enemy will conduct operations, and "the enemy commander's intentions remain unclear until he is forced to reveal them."[28] Even during battle or contact with the enemy it is still unclear what the enemy will do or how he will react. The commander must "guess whether the first shock of battle will steel the enemy's resolve and stiffen his resistance, or whether, like a Bologna flask, it will shatter as soon as its surface is scratched."[29]

Information technology and sensors might be able to provide a commander some locations and movement of enemy forces, and the ability to share the information with subordinates, but they cannot provide an adversary's intentions and plans and how he intends to impose his will. The battle command quality that revolves around enemy intentions is the ability to visualize the enemy through knowledge and training, part of personal and professional attributes, and intuition that Napoleon called "seeing the other side of the hill."[30]

Napoleon "never looked at [an enemy] position without asking himself, what [he would] do if the enemy appears there, or over there, or from this quarter, and what will *he* do in such case?"[31]

What *he* will do in such case, or the way and means with which the enemy fights, perpetuates uncertainty and friction and puts a premium on the commander's ability to master the skills of battle command. The U.S. military is not the only military with access to advanced technology, and U.S. commanders do not have a monopoly in warfighting expertise. Because of the proliferation and relatively low costs of some advanced technologies, adversaries can procure and use them to their advantage. Conversely, without advanced technologies, adversaries will use weapons and tactics, techniques, and procedures that favor their own operations to counter U.S. operations or to obtain a "temporary or localized battlespace or asymmetric advantage."[32] Technology cannot predict what the enemy or the enemy commander will do. The enemy is not dumb or tactically inept; he is cunning and will seek conventional and unconventional ways to impose his will on his adversary. Even during a time of rapid advancement in U.S. network-centric technology, operations in Somalia, Kosovo, and Iraq demonstrate a "thinking" adversary who can create uncertainty or impose his will despite the wide technological gap.

The Enemy Gets a Vote

During 1993 operations in Somalia, U.S. forces faced complex situations and adversaries who avoided the strengths of U.S. advanced technology. Somalia's "complex operational environment included the lack of central government, the absence of law and order, and a complex web of competing clans," which created a "chaotic, unpredictable situation."[33] The Director of Operations of United Nations Task Force Somalia stated that his forces' sensors "could not penetrate the faction leaders and truly understand what they were up to."[34]

The uncertainties that arose from the complex situation in Somalia were apparent in the raid by U.S. Army Rangers on 3 October 1993 during the Battle of Mogadishu. Somali fighters fought without uniforms, blended in with civilians, and used the complex urban terrain to their advantage to create tactical surprise.[35] The friction U.S. commanders faced during that battle included several helicopters being shot down by low-tech, rocket-propelled grenades, and lost rescue convoys. Combat actions demonstrated the "many limits of technology and revealed the absurdity of basing military doctrine and organization on the assumption of information superiority."[36]

In 1999, the U.S. and NATO air campaign against Yugoslavia to oust Serbian forces from Kosovo was an example of avoiding an adversary's strengths. Seven days into the campaign General Wesley Clark, Supreme Allied Commander, Europe, commented that NATO was facing "an intelligent and capable adversary who is trying to offset all our strategies."[37] Although they were no match against U.S. technology, the Serbians used old air defense systems to compel NATO planes to fly at higher altitudes, thus reducing their ability to acquire targets. The Serbians also used "innovative methods to keep their radars active [while] preventing them from being hit," and they used "low-technology tactics and improvisation to down an F-117 Stealth Fighter."[38] The Serbians also adapted to U.S. intelligence-gathering technology by replacing actual targets with decoys and timing U.S. reconnaissance flights to enable personnel to hide.[39]

A more current example of an adaptive adversary occurred during Operation Iraqi Freedom in 2003. During the night of 23-24 March, the U.S. Army conducted an attack using 32 AH-64 attack helicopters. In support of the 3d Infantry Division's attack north to Baghdad through the Karbala Gap, the Apaches were to destroy the artillery and armor units of the Iraqi Medina Division's 2d, 10th, and 14th Brigades. The brigades were somewhere north of Karbala and Hillah, although "their actual dispositions for the battle were unclear."[40]

The attack was a failure for U.S. forces. Thirty-one of 32 aircraft were damaged by enemy fire, and one Apache was shot down and its pilots captured. Damage to Iraqi forces was inconsequential. The attack failed in part because of the Iraqis' ability to fight with low-level technology, their simple tactics, and their ability to avoid the strengths of advanced U.S. technology. The Iraqis employed simple air defense techniques learned from 12 years of dealing with U.S.-imposed no-fly zones and by studying Apache operations during Operation Desert Storm. They used "early warning and tracking systems [that] operated below the U.S. [forces'] ability to detect and destroy"; "distributed their air defense weapons so widely that they could not be tracked or suppressed";

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A 29th Infantry Division officer talks with a villager in Afghanistan's Ghazni Province, 28 July 2005.

and "decentralized their command and control so that it could not be effectively disrupted."[41] Learning from the past and applying simple tactics, the Iraqis negated the U.S. technological advantage, kept their dispositions and intentions undetected, created uncertainty, and gained a temporary battlespace advantage.

Past operations in Somalia, Kosovo, and Iraq show that "even extreme technological superiority does not lead to information superiority or remove uncertainty and friction," especially when the enemy is not a "peer competitor"; also, that "uncertainty in the conduct of war lie[s] mainly outside technology's reach."[42] Operations in Kosovo also showed how the high volume of information that U.S. technology provides causes difficulties because the "vast intelligence system can create such a haystack of data that finding the one needle that will pinpoint a target in the right time frame is difficult, indeed."[43] Current operations in Iraq also demonstrate the difficulty in achieving information superiority over insurgents whose tactics are at the pinnacle of uncertainty and where human intelligence is more important than technology-driven intelligence.

Battle Command is Paramount

Why is mastering the art of battle command still paramount in network-centric warfare? The concepts derived from network-centric warfare complement and contrast with the many descriptions of battle command. Military theorists, historians, and professionals consistently describe battle command in terms of such cognitive qualities as judgment, intuition, and intellect. Their definition of battle command is based on the fact that war is a violent contest between thinking adversaries, an inexact science that requires commanders to understand and execute the art of war. In the end, network-centric operations consist of machines and networks that collect, organize, and disseminate large amounts of raw data and information while the commander brings the "requisite ability, experience, and wisdom to convert information to battlespace knowledge."[44] The increased volume of information puts a premium on the commander's ability to know if, what, and when to decide and to focus his staff on information relevant to his decisionmaking. If the commander is unable to focus his staff or is unable to ascertain the information he needs to make a decision, he will be deluged with irrelevant, partial, or unreliable information.

The speed of decisionmaking can only increase if the commander understands the information he needs and receives relevant, accurate information in a timely manner. When there is a lack of information, he must trust his intuition, experience, and judgment. Changing relevant information into decision superiority (and, in the end, information superiority) is predicated on the commander's ability to identify relevant information in an uninterrupted, high-volume flow of information and the ability to convert that information into decisions.

The commander's ability to judge quality information or to focus his staff on important information is developed through experience, training, and intuition. The commander's assessment of information comes from his execution of the art of battle command and requires him to "understand the current situation, broadly define the future situation, assess the difference between the two, and envision major actions that link them."[45]

Throughout time, technological advances have altered the technical face of warfare, but in the end, warfare is still a clash of wills wrought with uncertainty and friction. And, uncertainty and friction will always exist because of the human dimension of war and the vulnerabilities inherent in machines and systems. The human dimension of war—the physical, emotional, and psychological—drives uncertainty and friction that information technology cannot penetrate or predict. By assuming that current technology will reduce uncertainty and friction and by making information superiority sound automated, future leaders might develop unrealistic expectations, an overreliance on information systems, and the inability to appreciate the importance of mastering the art of battle command.

Understanding the future uses and limits of information technology and its effect on battle command is important. Similarly, "whether one accepts certainty or uncertainty as the dominant condition in war is important because the type of force one designs, the training the force conducts, the education of officers, and the military culture will differ greatly based on that fundamental belief."[46] The capabilities of network-centric warfare greatly enhance military operations, but the commander still must master the art of battle command in order to conduct decisive operations. ***MR***

NOTES

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